

CALIFORNIA DIVISION OF MINES AND GEOLOGY

Supplement<sup>#1</sup> to

Fault Evaluation Report FER-13

September 21, 1977

From August 1 to August 8 I examined a trench across the Ventura fault in the Saticoy quadrangle (see figure S-1). The trench was dug by Geotechnical Consultants, Inc. for the City of Ventura as part of an investigation for a proposed reservoir. Logging of the trench was done independently by Dave Gardner (Geotechnical Consultants), Andre Sarna-Wojcicki and Bob Yerkes (both of U.S.G.S.), and myself (Note: the log included, figure S-2, was done entirely by myself).

The reservoir site itself is a lemon grove. Some time during the recent past (probably 50 years ±) the site was benched in order to permit better irrigation. During the trenching operations these benches were obliterated so that the backhoe could traverse the site.

The trenching operations were conducted in a leap-frog fashion; 50 feet of trench were opened, logged, and then backfilled either just before or immediately after the next section was opened. Thus, one did not have the opportunity to recheck sections already logged. The time allowed for visiting geologists to log varied from 30 minutes for the first 70 feet of trench, to about 3½ hours for the 50-foot section between 300 and 350 feet. On the average 1½ to 2 hours were spent logging a 50 to 70 foot long section.

The soil on the site is probably quite young. It is possible that during the benching the original soil cover was mostly or entirely removed. Thus, it is unlikely that any displacement of the soils could

be observed and none was. The soil was laced with tree roots, and I could discern no distinct sub-units within the soil.

In general, the area is immediately underlain by an alluvial fan deposit which is locally folded into a faulted monocline. Streams once meandered across the fan sometimes paralleling the trench (figure S-2, 200 feet to 235 feet). The most common sediment exposed in the trench was a tan, clayey silt. Below this unit is a brown, massive, silty clay. The contact between the two units was rather irregular.

As can be seen from the trench log, the faults observed occur in an 80 to 100 foot wide zone. The faults themselves are mostly north-dipping, normal faults, and displace units by from about two to six inches. The most southerly fault (at 380 feet) is nearly vertical and offsets strata in the opposite sense (south side down). This fault may be a north-dipping, reverse fault at depth. The fault at about 313 feet could represent strike-slip displacement, reverse displacement or both (note the change in the gravel bed at 10 foot depth, and the anomalous offset at 12 foot depth).

North of these faults, soil-filled cracks were noted. Additional soil filled cracks are present between stations 230 feet and 280 feet. The latter were thought to be related to the tree roots at the time this section of the trench was open, but as *I began to find more and larger cracks* I began to reconsider their origin -- too late, however, to relog that section of trench.

One can compare the log of this trench with that of Sarna-Wojcicki, et al. (1976), and observe that the features are quite similar (also confirmed by R. Yerkes and A. Sarna-Wojcicki, <sup>1977</sup> p.c.). Sarna-Wojcicki

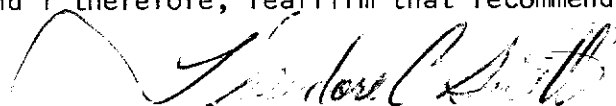
<sup>1977</sup>  
(p.c.) feels that the materials trenched at this site are contemporaneous with the Harmon Fan, to the east, and younger than the materials present at the County Hospital Site, to the west.

CONCLUSIONS BASED ON EVIDENCE PRESENTED IN  
FER-13 AND THIS SUPPLEMENT, AND SPECULATIONS  
ON THE ORIGIN OF FEATURES

The length, width, and height of the topographic feature mapped by Sarna-Wojcicki, et al. (1976), the offset at depth documented by <sup>(1974, p. 257)</sup> and <sup>Cogle and Hacker (1969)</sup> Quick, and the features exposed in the two trenches all suggest the existence of a buried fault along which there has been significant recent displacement. The relatively unconsolidated sediments present at these sites may not permit the upward propagation of a simple fault plane to the ground surface. Instead, the at-depth displacement manifests itself mainly as a monoclinal fold at the surface, with accompanying faulting.

While the primary reverse or thrust fault may not reach the surface everywhere, the secondary faults clearly do. Certainly, there is a potential hazard of surface fault rupture to any structures built over one of these secondary faults. While the amount of displacement along any one of these secondary faults presumably would be less than that along the primary fault (at depth), the cumulative uplift across the faulted monocline may be equivalent to displacement at depth. Thus, in addition to complex surface faulting, significant permanent tilting would be expected along the identified scarp (which varies in width from 50 to 250 feet).

Thus, I conclude that the recommendation to zone these features  
is right and proper, and I therefore, reaffirm that recommendation.



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*I agree with the  
recommendation, based  
on the data presented. When  
to new reports of geotechnical  
consultants become available,  
we will need to re-evaluate  
and reconsider any new  
information.*

*Editt  
9/26/77*

FIG 13

Figure S-1. Ventura Reservoir Site  
Trench Location, Saticoy Quadrangle  
(base map is Preliminary SSZ Map).



FOR REVIEW PURPOSE  
This map invalid on  
when Official Map